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IS 7867 (1975): Continuous Filament Textile Polyamide (Nylon) Yarn [TXD 31: Man-Made Fibres, Cotton and their Products]

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AMENDMENT NO. 1 DECEMBER 2002
TO
IS 7867 : 1975 SPECIFICATION FOR CONTINUOUS FILAMENT TEXTILE POLYAMIDE (NYLON) YARN

[*Page* 2, *Table* 1, *Sl No.* (ix)] — Insert the following after Sl No. (ix):

(1)	(2)	(3)	(4)	(5)
x)	Boiling water shrinkage, percent	15 ± 2	15 ± 2	Annex A
xi)	Hot air shrinkage, percent	18 ± 2	18 ± 2	Annex A

(*Page* 2, *clause* 5) — Insert the following after clause 5:

ANNEX A
[*Table* 1, *Sl No.* (x) and (xi)]

METHOD OF TEST

A-1 Apparatus

A-1.1 *Reel* — A hand or motor-driven reel having a nominal perimeter of 1 m. The reel should have a traversing mechanism that will minimize bunching of ends on the reel, a yarn-tensioning device capable of maintaining tension below 10 mN/tex or 1.0 gf/tex and a yarn length or revolution indicator. A warning bell that will ring just prior to the specified number of reel revolutions is recommended. A collapsible arm is advisable for convenience in skein removal.

A-1.2 *Measuring Scale* — A tape or scale accurate to 1 part in 1 000 is recommended. Any scale length exceeding the reel diameter by 250 mm allowing for the extension of the skein is satisfactory. The scale should be mounted vertically. The top hook holds the skein and is mounted with support surface in line with the zero index of the scale.

A-1.3 *Metal Hook* — The bottom metal hook which may have a pointer attached is designed to hang from the skein shaped to receive the tensioning weights, and has a mass known to 1 part in 1 000.

A-1.4 *Tensioning Masses* — Accurate to 1 part in 1 000.

A-1.5 *For Boiling Water*

A-1.5.1 *Water bath of sufficient size for 40 : 1 weight ratio*

A-1.5.2 *Roller wringer or centrifugi extractor*

A-1.5.3 *Distilled or demineralized water*

A-1.5.4 *Nonionic wetting agent*

A-1.6 *For Hot Air*

A-1.6.1 *Hot air oven* — A forced draft oven capable of meeting the required temperature. There must be means of suspending the skein in the oven. This may be accomplished with a rod with cup hooks from which skeins can be suspended. The rod may be mounted on a stand for placement in the oven, skeins should not be allowed to touch the sides of oven.

A-2 Preparation of Specimens

A-2.1 Reel and discard the outer 10 percent or 100 m material from each package.

A-2.2 Reel an 80-wrap skein using a uniform tension of not over 10 mN/tex or 1.0 gf/tex. Lay the yarn smoothly on the reel overlap, and loosely tie the beginning and trailing ends of the skein. To reduce tangling, the skein may be laced loosely. The number of wraps may be increased or decreased for very fine or very coarse yarns by agreement of the interested parties.

A-2.3 Identify each skein separately.

A-3 Conditioning

A-3.1 Condition the prepared skeins for testing as directed as per IS 6359 : 1971 'Method of conditioning of textiles'. Consider equilibrium to have been reached when the change in mass of the specimens between successive weighings made at intervals of not less than 2 hours does not exceed 0.1% of the mass of the specimen.

A-3.2 Condition the prepared skeins for a minimum of 24 hours which is sufficient time for yarn recovery from the package winding tensions as well as to reach the moisture equilibrium conditions as specified in **A-3.1**.

A-4 Measurement oF Skeins

A-4.1 Make all loop skein length measurements in the standard atmosphere for testing textiles which is air maintained at a relative humidity of 65 ± 2% and at a temperature of 27 ± 2^{0}C.

A-4.2 Determine the linear density of the yarn if unknown by using test method as per IS 7703 (Part 1) : 1990 'Method of test for continuous polyester and polymide flat yarn — Linear density'.

A-4.3 Calculate a tension force corresponding to 5.0 mN/tex or 0.5 gf/tex using Equation 1 or 2

Tension force, $mN = 5.0 \times N \times T$.............(1)

Tension force, $gf = 0.5 \times N \times T$................(2)

where

N = number of ends, that is, twice the number of wraps in the skein; and

T = yarn number, tex.

A-4.4 Measure the loop-length of each conditioned skein.

A-4.4.1 Hang the conditioned skein from a hook at the top of the measuring scale with the inside of the top of the skein and the zero index of the scale aligned.

A-4.4.2 After 30 ± 3 s, measure the inside length of the skein to the nearest 1 mm.

A-4.4.3 Record the loop-length of each skein.

A-4.5 Twist each skein into a figure 8 and bring the ends together to form a two-coil loop. Repeat the procedure to form a four-coil loop.

A-4.6 Continue as directed in Section **A-5** for boiling water or on Section **A-6** for hot air exposure.

A-5 Boiling Water Exposure

A-5.1 Wrap each skein carefully in cheese cloth and secure the cheese cloth (sewed, tied) to prevent the entanglement of the yarn in actively boiling water.

A-5.2 Make up a distilled or demineralized water bath, which is 40 times the weight of the wrapped skeins, and contains a 0.05 percent solution of wetting agent by weight.

A-5.3 Bring the bath to a continuously rolling boil and immerse the skeins for 30 min.

A-5.4 Allow the bath to cool to at least 50°C before decanting the solution from the specimens.

A-5.4.1 Do not cool the bath by overflowing or rinsing the specimen because the wetting agent will serve as a lubricant for the strands in making the final length measurement.

A-5.5 Use a centrifuge or roll wringer to damp dry the wrapped skeins.

A-5.6 Remove the skeins from the cheese cloth and complete drying them at room temperature or for 1 h in a forced-draft oven at 65°C maximum.

A-5.7 Recondition each dried skein in the standard atmosphere for testing textiles as directed in **A-3.1**.

A-5.8 Continue as directed in **A-7**.

A-6 Hot Air Exposure

A-6.1 Preheat the oven at the selected temperature.

A-6.1.1 Shut-off the oven fan, quickly open the door, and suspend the measured skeins in the oven.

A-6.1.2 Hang the skeins to prevent their touching the bottom or sides of the oven. Close the door, and restart the oven. Keep the door open time to a minimum.

A-6.1.3 When the oven has returned to the selected temperature, begin measuring the agreed upon exposure time.

A-6.1.4 At the end of this period, shut off the oven fan and remove the skeins.

A-6.1.5 Recondition the skeins in the standard atmosphere for textile testing.

A-6.1.6 Continue as directed in **A-7**.

A-7 Remeasurement of Skeins

A-7.1 Remeasure skeins as directed in **A-5.4**. Record the measurement as the final length.

A-8 Calculation

A-8.1 Calculate the shrinkage of each skein to the nearest 1 percent using Equation 3:

Shrinkage, percent $= 100\,(A - B)/A$..........................(3)

where

A = original loop-length of each skein, and

B = final loop-length of each skein.

A-8.2 Calculate the average for each package, the laboratory sample, and the lot to the nearest 0.1 percent.

A-8.3 Calculate the standard deviation for each laboratory sample and the entire lot sample.

(TX 31)

Reprography Unit, BIS, New Delhi, India

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"पुनर्पष्ट १९९५"
"RE-AFFIRMED 199

Indian Standard

SPECIFICATION FOR CONTINUOUS FILAMENT TEXTILE POLYAMIDE (NYLON) YARN

1. Scope — Prescribes requirements of continuous filament, textile polyamide (nylon) yarn used for textile and other general purposes. Commercially known as ' Flat ' yarn.

2. Requirements

2.1 The material shall be tested in respect of the following characteristics:

- a) Identification
- b) Commercial mass
- c) Conventional allowance
- d) Tex (or denier)
- e) Tenacity
  - i) Monofilament
  - ii) Multifilament
- f) Elongation
- g) Mean linear irregularity or evenness
- h) Broken filament
- j) Undrawn yarn
- k) Oil content

2.2 The material shall satisfy the requirements given in Table 1.

3. Atmospheric Conditions for Testing

3.1 *Conditioning and Testing* — The test specimens shall be conditioned for 24 hours in accordance with IS : 6359-1971 ' Method for conditioning of textiles ' and tested in the standard atmosphere of 27 ± 2°C temperature and 65 ± 2 percent relative humidity.

4. Marking

4.1 Each cone or cop of yarn shall be marked by attaching a label with the following:

- a) Tex (denier) of yarn;
- b) The legend ' First Grade ';
- c) Manufacturer's name, initials or trade-mark; and
- d) Mass of package.

4.2 The cases containing yarn shall be marked with the following:

- a) Name of the material;
- b) The legend ' First Grade ';
- c) Tex (denier) of yarn;
- d) Gross mass;
- e) Net mass; and
- f) Name of manufacturer, initials and trade-mark.

Silk, Man-Made Fibre and Products Sectional Committee, TDC 10 : 1/P2 [Ref : Doc : TDC 10 (1535)]

Adopted 10 December 1975	© February 1976, BIS	Gr 1

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

TABLE 1 REQUIREMENTS FOR TEXTILE POLYAMIDE (NYLON) YARN

(*Clause* 2.2)

Sl No.	Characteristic	Requirement		Method of Test
		Monofilament	Multifilament	
(1)	(2)	(3)	(4)	(5)
i)	Denier, deviation, percent (lot average)	±4 percent	a) ±3·0 for 2·2 to 5·5 tex (20 to 50 d) b) ±2·5 for 5·5 tex or above (50 d or above)	IS : 7703 (Part I)-1975*
ii)	Tenacity, g/tex (or g/d) (lot average)	45·0 (or 5·0), *Min*	40·5 (or 4·5), *Min*	IS : 7703 (Part II)-1975*
iii)	Percentage elongation at break, percent	40 to 50	35 to 45	IS : 7703 (Part II)-1975*
iv)	Mean linear irregularity or evenness (U%)	Not more than or equal to 1·5	Not more than or equal to 1·5	IS : 7703 (Part IV)-1975*
v)	Tolerance on commercial mass, percent	±1	±1	IS : 7703 (Part III)-1975*
vi)	Conventional allowance, percent	Not exceeding 5·75		—
vii)	Oil content, percent	Not exceeding 1·5		—
viii)	Broken filaments	There should not be any visible broken filaments on the body of the cones, cops or cheeses		On examination of the surface of a package of nylon yarn, say cone or cop there shall be no visible broken filaments
ix)	Undrawn yarn	Nubs having a length more than 2 mm are not permitted		From the yarn under test, make a hose on a knitting machine. Dye the hose to a deep shade. Any undrawn yarn would be clearly visible as specks or irregularly dyed patch

*Methods of test for continuous filament polyamide and polyamide flat yarn:
(Part I)-1975 Linear density.
(Part II)-1975 Tenacity and elongation at break.
(Part III)-1975 Commercial mass.
(Part IV)-1975 Mean linear irregularity or evenness.

4.3 *Certification Marking* — Details available with the Bureau of Indian Standards.

5. Packing — The yarn shall be packed in accordance with the procedure laid down in IS : 2195-1964 ' Code for inland packaging of man-made fibre, fabrics and man-made fibre yarns '.

EXPLANATORY NOTE

The production of continuous filament polyamide (nylon) yarn in the country has steadily been increasing, thanks to its multifarious end uses. With the increase in the demand of the yarn particularly for textile application, the necessity has been felt to define the quality of such a yarn to ensure production of good quality fabrics. This standard defines the characteristics that are required to be tested and for qualifying it as first grade.

Reprography Unit, BIS, New Delhi, India